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CLAIMS

What is claimed is:

1. A lens-interchangeable digital camera system, comprising:
 - a first camera body including a first image pickup element having a pixel pitch of about 7 μm and a first optical low pass filter having a thickness determined based on the pixel pitch of about 7 μm ;
 - an interchangeable lens removably attached to the first camera body and having a function for correcting the curvature-of-field aberration on an image-forming surface of the image pickup element; and
 - a second camera body including a second image element to which the interchangeable lens can be removably attached, having a pixel pitch different from the pixel pitch of about 7 μm and a more number of pixels than that of the first image pickup element, a second optical low pass filter having the thickness determined in accordance with the pixel pitch of the second image pickup element and being thinner than the first optical low pass filter, and a compensating optical system for correcting a difference in optical path length caused due to the difference in thickness of the first optical low pass filter and second optical low pass filter.
2. The lens-interchangeable digital camera system according to Claim 1, wherein the first and second optical low pass filters are optical elements having a double refraction characteristic, and the compensating optical system does not have a double refraction characteristic.
3. The lens-interchangeable digital camera system according to Claim 2,

wherein the first and second optical low pass filters are constituted by crystal.

4. The lens-interchangeable digital camera system according to Claim 1, wherein the reflective index of the compensating optical system is close to the reflective index of the second optical low pass filter.

5. The lens-interchangeable digital camera system according to Claim 1, wherein the sum of the thickness of the second optical low pass filter and the thickness of the compensating optical system is substantially equal to the thickness of the first optical low pass filter.

6. A lens-interchangeable digital camera system, comprising:

a first camera body including a first image pickup element having a first pixel pitch and a first optical low pass filter having a thickness determined in accordance with the first pixel pitch of the first image pickup element;

an interchangeable lens attachable to the first camera body, having a correction function for optimizing the curvature-of-field aberration on an image-forming surface of the first image pickup element when the interchangeable lens is attached to the first camera body; and

a second camera body to which the interchangeable lens can be attached, including a second image pickup element having a second pixel pitch different from the first pixel pitch, a second optical low pass filter having a thickness determined in accordance with the second pixel pitch and being thinner than the first optical low pass filter, and a compensating optical system for correcting the curvature-of-field aberration on the image-forming surface of the second image pickup element

caused due to the difference in thickness of the first optical low pass filter and the second optical low pass filter.

7. The lens-interchangeable digital camera system according to Claim 6, wherein the first pixel pitch is about 7 μm .
8. The lens-interchangeable digital camera system according to Claim 6, wherein the second pixel pitch is narrower than the first pixel pitch.
9. The lens-interchangeable digital camera system according to Claim 6, the second image pickup element has more number of pixels than that of the first image pickup element.
10. A lens-interchangeable digital camera system, comprising:
an interchangeable lens for which optical aberration is corrected so as to be compliant with a reference camera body; and
a camera body to which the interchangeable lens can be attached, having an image pickup element, an optical element within a photographic optical path of the image pickup element, and a compensating optical element provided within the photographic optical path together with the optical element in order to correct aberration due to the combination of the interchangeable lens and the optical element.
11. The lens-interchangeable digital camera system according to Claim 10, wherein the interchangeable lens is designed so as to minimize the curvature-of-field aberration in combination with the reference camera body.

12. A lens-interchangeable digital camera system, comprising:
a first camera body including a first optical low pass filter;
an interchangeable lens compliant with the first camera body and set such that an optical characteristic can correct aberration due to the first optical low pass filter; and
a second camera body to which the interchangeable lens can be attached, including a second optical low pass filter thinner than the first optical low pass filter and a compensating optical system for correcting the difference in thickness of the first optical low pass filter and the second optical low pass filter.

13. A lens-interchangeable digital camera system according to Claim 12, wherein the first and second optical low pass filters are optical elements having a double refraction characteristic, and the compensating optical system is an optical element having no double refraction characteristic.

14. A camera body to which an interchangeable lens for correcting aberration to fit to a reference camera body can be attached, comprising:
an image pickup element having a different pixel pitch from that of the image pickup element in the reference camera body;
an optical low pass filter provided in a photographic optical path and having a thickness in accordance with the pixel pitch of the image pickup element; and
a compensating optical system for correcting aberration due to the combination of the interchangeable lens and the optical low pass filter.

15. An interchangeable lens removably attached to multiple camera bodies, the interchangeable lens comprising:

a lens side mount portion for engaging with a mount portion of the camera body; and

a photographic optical system for optimizing aberration on the image pickup surface for the thickest optical low pass filter in the multiple camera bodies.

16. An interchangeable lens according to Claim 15,

wherein the curvature-of-field aberration on the image pickup surface is minimized for a camera body having the thickest optical low pass filter.

17. The interchangeable lens according to Claim 16,

wherein the optical low pass filter has a thickness corresponding to an image pickup element having a pixel pitch of about 7 μm .

18. The interchangeable lens according to Claim 15,

wherein the thickest optical low pass filter contains crystal.

19. An interchangeable lens removably attached to multiple camera bodies, comprising:

a lens side mount portion for engaging with a mount portion of the camera body; and

a photographic optical system for optimizing aberration on the picked up image for a camera body having the thickest optical low pass filter in the multiple camera bodies.

20. An interchangeable lens removably attached to multiple camera bodies, comprising:

a lens side mount portion for engaging with a mount portion of the camera body; and

a photographic optical system for optimizing aberration on the image pickup surface for the camera body having an optical low pass filter having a thickness corresponding to an image pickup element having a pixel pitch of about 7 μm in the multiple camera bodies.

21. A camera body to which an interchangeable lens optically designed for a reference camera body can be removably attached, comprising:

an interchangeable lens mount portion;

an image pickup element; and

a compensating optical system provided between the mount portion and the image pickup element such that the optical length between the interchangeable lens mount portion and the image pickup element is equal to that of the reference camera body.

22. The camera body according to Claim 21,
wherein the compensating optical system has a reflective index substantially equal to an optical low pass filter in the reference camera body.

23. The camera body according to Claim 21,
wherein the camera body has an optical low pass filter between the interchangeable lens mount portion and an image pickup surface of the image pickup element, and the compensating optical system compensates a difference in

optical path length between an optical low pass filter in the reference camera body and the optical low pass filter in the camera body.

24. The camera body according to Claim 23,
wherein the compensating optical system has substantially the same thickness as the difference in thickness between the optical low pass filter in the reference camera body and an optical low pass filter in the camera body.

25. The camera body according to Claim 23,
wherein the optical low pass filter in the camera body has a thickness different from that of an optical low pass filter in the reference camera body.

26. The camera body according to Claim 25,
wherein the optical low pass filter in the camera body is thinner than an optical low pass filter in the reference camera body.

27. A reference camera body, comprising:
an interchangeable lens mount portion for attaching an interchangeable lens;
an image pickup element; and
an optical low pass filter between the interchangeable lens mount portion and an image pickup surface of the image pickup element,
wherein the reference camera body is one of multiple camera bodies to which an interchangeable lens can be attached and is a reference for the interchangeable lens, and the optical low pass filter is the thickest in optical low pass filters among the multiple camera bodies.

28. A reference camera body, comprising:
an interchangeable lens mount portion for attaching an interchangeable lens;
an image pickup element; and
an optical low pass filter between the interchangeable lens mount portion and
an image pickup surface of the image pickup element,
wherein the camera body is one of multiple camera bodies to which an
interchangeable lens can be attached and is a reference for the interchangeable lens,
and the aberration on an image pickup surface of the image pickup element is
optimized by a combination of the optical low pass filter and the interchangeable
lens.

29. The reference camera body according to Claim 28,
wherein the thickness of the optical low pass filter is determined in
accordance with the image pickup element having a pixel pitch of about 7 μm .

30. The reference camera body according to Claim 28,
wherein the optical low pass filter is crystal.

31. The lens-interchangeable digital camera system, comprising:
a first camera body including a first optical element having a predetermined
function;
an interchangeable lens compliant with the first camera body, having an
optical characteristic designed for correcting aberration for the first camera body;
and
a camera body to which the interchangeable lens can be attached, having:

a second optical element which has the same function as that of the first optical element and which is thinner than the first optical element; and a compensating optical system for correcting a difference in thickness between the first optical element and the second optical element.